

**IN THE UNITED STATES PATENT
AND TRADEMARK OFFICE**

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POOL CLEANER CONTROL DEVICE

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1 **I. TITLE: *POOL CLEANER CONTROL DEVICE***

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3 **II. BACKGROUND OF THE INVENTION**

4
5 **1. Field of the Invention.**

6
7 The present invention relates to a pool cleaner control device, and
8 more particularly, to a control device for pool skimmers used to filter the
9 water in a body of water, such as a swimming pool.
10

11 **2. Description of the Related Art.**

12
13 Several designs for pool cleaner devices have been designed in the
14 past. These devices are generally referred to as skimmers and they
15 typically include a filter basket assembly that collects debris from the body
16 of water they clean. The inlet is typically connected to a hose that sucks the
17 water from an area of a body of water. This inherently limits the cleaning
18 operation to one inlet port only. The present invention includes a device
19 used with skimmers that permits a user to switch from two active ports or
20 inlets after a predetermined period of time. This permits a user to process
21 (filter) water from two different areas.
22

23 **III. SUMMARY OF THE INVENTION**

24
25 It is one of the main objects of the present invention to provide a
26 control device for switching the operation of a skimmer between two inlet
27 ports connected to a body of water thereby permitting a user to clean the
28 water from two separate areas.

1 It is another object of this invention to provide a device that works
2 with skimmers to filter the water in a pool.

3
4 It is yet another object of this invention to provide such a device that
5 is inexpensive to manufacture and maintain while retaining its
6 effectiveness.

7
8 Further objects of the invention will be brought out in the following
9 part of the specification, wherein detailed description is for the purpose of
10 fully disclosing the invention without placing limitations thereon.

11 12 **IV. BRIEF DESCRIPTION OF THE DRAWINGS**

13
14 With the above and other related objects in view, the invention
15 consists in the details of construction and combination of parts as will be
16 more fully understood from the following description, when read in
17 conjunction with the accompanying drawings in which:

18
19 **Figure 1** represents a partial cross-sectional view of the preferred
20 embodiment for the present invention where the inlet connected to the
21 hose is operational.

22
23 **Figure 2** shows the partial cross-sectional view of figure 1 in the
24 opposite position with the inlet connected to the hose is blocked and the
25 other inlet operational.

1 **Figure 3** illustrates an enlarged cross-sectional view of the piston's
2 shaft, showing the restricting valve assembly and the filter cap assembly
3 used for the present invention.

4
5 **Figure 4** is a representation of a partial cross-sectional view of an
6 alternate embodiment for the present invention, wherein the diaphragm
7 has an inverted cup shape.

8
9 **Figure 5** shows of a partial cross-sectional view of other alternate
10 embodiment for the present invention, wherein a spring member is used.

11 12 **V. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT**

13
14 Referring now to the drawings, where the present invention is
15 generally referred to with numeral **10**, it can be observed that it basically
16 includes skimmer assembly **20**, cover assembly **30**, housing assembly **40**,
17 electrical suction pump **50**, piston assembly **60** and flexible diaphragm skirt
18 **70**, as shown in figure 1. Timer assembly **150** is used to set predetermined
19 operation time intervals.

20
21 As seen in figure 1, skimmer assembly **20** includes cylindrical
22 housing **22** with bottom wall **24** and filter basket assembly **26** housed
23 therein. Filter basket assembly **26** includes outwardly extending peripheral
24 flange **27**, which is mounted to inwardly extending supporting flange **21** of
25 housing **22**. Bottom wall **24** includes bottom outlet port **25**.

26
27 Cover assembly **30** includes inlet through openings **32** and **34** and
28 shaft through opening **36**. Hose **31** has one end mounted to inlet through

1 opening 32 and its distal end suctions the water from the bottom of the
2 swimming pool at a remote location. Cover assembly 30 also includes
3 hingedly mounted valve assembly 38 for selectively closing inlet through
4 opening 34. Actuating member 33 has ends 35 and 35'. End 35 is attached
5 to upper end 65 of elongated tubular shaft 64 and end 35' is cooperatively
6 engaged to the distal end of valve assembly 38 to open and close the latter
7 in response to the position of upper end 65. Cover 30 and inwardly
8 extending supporting flange 21 sandwich flange 27. Thus, there are only
9 three openings through which water enters housing assembly 40.
10

11 Housing assembly 40 is mounted within filter basket assembly 26 of
12 skimmer assembly 20 and held in place with fasteners 39 that pass through
13 cover 30. Housing assembly 40 includes internal wall 42. In the preferred
14 embodiment, housing assembly 40 includes lower and upper cylindrical
15 members 44 and 48, respectively, coaxially mounted. Cylindrical members
16 44 and 48 are longitudinally and abuttingly mounted with respect to each
17 other. Lower cylindrical member 44 includes ends 45 and 47. End 45 is
18 closed with bottom wall 46 and end 47 is open. Upper cylindrical member
19 48 is open at both ends and includes cutout 41.
20

21 Electrical suction pump 50 includes inlet 52 and outlet 54. Inlet 52 is
22 connected to outlet port 25 of bottom wall 24. The suctioned and filtered
23 water returns to the body of water through outlet 54.
24

25 Piston assembly 60 is housed within lower cylindrical member 44 in
26 figure 1. Piston assembly 60 includes bottom surface 62 and top surface 63.
27 Shaft 64 is perpendicularly with respect to surface 63 and passes through
28 piston assembly 60. Elongated tubular shaft 64 passes through central

opening 36. Sealing sleeve 37 is secured to opening 36 to permit shaft 64 to go through. Elongated tubular shaft 64 has cooperative dimensions to slidably and sealingly pass through sleeve 37. As best seen in figure 3, shaft 64 includes upper end 65 with internal threaded portion 66 and lower end 67 has external threaded portion 68. Central through opening 69 includes conical recess 169 ending with a larger internal at end 65.

Lower plate 76 and upper plate 74 include cooperative central threaded openings 75 and 77 that receive threaded portion 68. One of their functions is to secure shaft 64. Upper plate 74 is mounted against bottom surface 62 and with lower plate 76 sandwiching skirt 70. Lower plate 76 comes in contact with bottom wall 46 at the lowermost position of piston assembly 60.

In the preferred embodiment shown in figures 1 and 2, flexible diaphragm skirt 70 has a substantially hemispherical shape covering piston assembly 60. Flexible diaphragm skirt 70 includes central opening 71 and peripheral edge 72. Flexible diaphragm skirt 70 covers bottom surface 62 of piston assembly 60 and extends around the peripheral outer wall of piston assembly 60. Peripheral edge 72 is mounted over open end 47 of lower cylindrical member 44, in the preferred embodiment. Peripheral edge 72 is sandwiched between cylindrical members 44 and 48. Peripheral edge 72 can also be fixed to internal wall 42 of housing assembly 40 in other manners. Flexible diaphragm skirt 70 is secured to bottom surface 62 with upper and lower plates 74 and 76. Upper plate 74 has threaded central opening 75. Lower plate 76 has threaded central opening 77. Upper plate 74 is rigidly mounted to bottom surface 62 of piston assembly 60. External threaded portion 68 of lower end 67 passes through central

opening 61, engage threaded central opening 75, central opening 71 and engage to threaded central opening 77, as best seen in figures 1 and 2.

As best seen in figure 3, restricting valve assembly 80 is removably mounted to central through opening 69 of elongated tubular shaft 64 next to end 65. Restricting valve assembly 80 rests inside recess 169. Restricting valve assembly 80 includes central through opening 81, upper and lower ends 82 and 84, longitudinal channels 86, and O-ring 88. Through opening 81 has a considerably smaller diameter than central through opening 69 of elongated tubular shaft 64. With the reduced diameter of through opening 81, restricting valve assembly 80 restricts the flow of water inside elongated tubular shaft 64. Varying the diameter of opening 81 changes the time it takes piston assembly 60 to travel inside cylindrical members 44 and 48. Therefore, a user can regulate this time by replacing valve assemblies 80 of different diameters.

As seen in figure 1, the pressure differential created by electrical suction pump 50 at bottom outlet port 25 suctions the water in cavity 23 causing water to go through cutout 41 from space 43. The water displaced from space 43 is replaced with water coming from through inlet through opening 32. Piston assembly 60 is allowed to move towards cover assembly 30 as water passing through opening 69 enters space 43 below bottom wall 62. The speed at which piston assembly 60 moves upwardly depends on the flow rate of water through restricting valve assembly 80. Water enters the space 43' to permit piston assembly 60 to move up. When top surface 63 of piston assembly 60 reaches cover assembly 30, valve assembly 38 is opened permitting water to enter to inlet through opening

1 34 and closing inlet through opening 32. Since piston 60 stops moving up
2 at the extreme position, no more water comes in space 43'.
3

4 As best seen in figure 3, filter cap assembly 90 is mounted to internal
5 threaded portion 66 of elongated tubular shaft 64. Filter cap assembly 90
6 includes central opening 91, upper end 92, stopper flange 93, lower end 94,
7 threaded portion 95 and mesh 96. Its purpose is to keep restricting valve
8 assembly 80 in place and filter the water to prevent clogging opening 81.
9 When suction pump 50 stops, valve assembly 80 moves upwardly against
10 end 94 by the pressure exerted on the water in space 43' by the weight of
11 piston assembly 60. Upper end 82 comes in contact with lower end 94 and
12 O-ring 88 is separated from its seat allowing water to go up with a larger
13 effective diameter since in addition to opening 81 the water will flow
14 through channels 86.
15

16 An alternate embodiment for pool cleaner control device 100 is
17 shown in figure 4, wherein flexible diaphragm skirt 170 has a substantially
18 inverted cup shape with cooperative dimensions to cover bottom surface
19 62 of piston assembly 60. The peripheral edge 172 coacts with the internal
20 wall surface of housing assembly 40 to effectively and substantial seal
21 space 43' from space 43.
22

23 It is also possible to use a spring 264 to urge piston assembly 60
24 against bottom wall 46 if the pulling force of the water current is two
25 strong, as shown alternate embodiment 200 represented in figure 5.
26

27 Shimmers 20 are typically used with a timer that can be regulated to
28 stop the operation at predetermined time periods. In one preferred setting,

1 the timer period is chosen to operate each inlet port for substantially equal
2 time periods. This requires selecting a predetermined diameter for
3 opening 81, and the characteristics of spring 264 if one is used.

4
5 The foregoing description conveys the best understanding of the
6 objectives and advantages of the present invention. Different embodiments
7 may be made of the inventive concept of this invention. It is to be
8 understood that all matter disclosed herein is to be interpreted merely as
9 illustrative, and not in a limiting sense.